Abstract Submitted
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Phase-ordering dynamics in itinerant quantum ferromagnets R. SAHA, Dept. of Physics, University of Oregon, Eugene, OR 97403 and Dept. of Physics, University of Maryland, College Park, MD 20742, D. BELITZ, Dept. of Physics, University of Oregon, Eugene, OR 97403, T.R. KIRKPATRICK, Dept. of Physics, University of Maryland, College Park, MD 20742 — Phase ordering following a rapid quench from the disordered phase to the ordered phase occurs via growth of domains that arise from spontaneous fluctuations. The linear size L of these domains grow as a power law function of time for late times: $L(t) \propto t^{1/z}$, with z a dynamical exponent[1]. Until now this description of phase ordering dynamics has been applied to classical systems only. We apply this theory to describe domain growth in both clean and dirty itinerant quantum ferromagnets. The fluctuation effects that invalidate Hertz's theory of the quantum phase transition[2] also affect the phase ordering. For a quench into the ordered phase a transient regime appears, where the dynamical exponent differs from the classical case, and for asymptotically long times the prefactor of the growth law has an anomalous magnetization dependence[3]. A quench to the quantum critical point results in a growth law which is not a power-law function of time.
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